**We claim:**

1. A method for detecting blood loss in a patient, the method comprising:

(a) taking a pulse volume measurement from the patient;

(b) comparing the pulse volume taken in step (a) to a normal table; and

(c) detecting the blood loss in accordance with the comparison of step (b).

2. The method of claim 1, wherein steps (a)-(c) are performed a plurality of times to track the blood loss.

3. The method of claim 2, further comprising determining, from the blood loss, whether the patient is suffering from post-operative blood loss.

4. The method of claim 3, wherein the post-operative blood loss is occult hemorrhage.

5. The method of claim 3, wherein the post-operative blood loss is rupture of the patient's femoral artery.

6. The method of claim 2, wherein the blood loss is tracked to determine effectiveness of blood transfusion into the patient.

7. A method for detecting a septic condition in a patient, the method comprising:

(a) taking a pulse volume measurement from the patient;

(b) performing step (a) a plurality of times to monitor the patient's pulse volume;

(c) detecting a change in the patient's pulse volume; and

(d) detecting the septic condition in accordance with the change in the patient's pulse volume.

8. The method of claim 7, wherein the septic condition is septic shock, and wherein the change in the patient's pulse volume indicates vascular instability.

9. The method of claim 7, wherein the septic condition is neonatal sepsis.

10. A method for detecting cardiogenic shock in a patient, the method comprising:

(a) taking a pulse volume measurement from the patient;

(b) determining, from the pulse volume measurement taken in step (a), whether the patient suffers from decreased cardiac output; and

(c) detecting the cardiogenic shock in accordance with the determination of step (b).

11. The method of claim 10, wherein steps (a)-(c) are performed a plurality of times to determine effectiveness of treatment of the cardiogenic shock.

12. A method for detecting a condition associated with neonatal health in a neonatal patient, the method comprising:

(a) taking a pulse volume measurement from the neonatal patient; and

(b) detecting the condition in accordance with the pulse volume measurement.

13. The method of claim 12, wherein step (a) is performed a plurality of times to detect a change in the pulse volume measurement, and wherein step (b) is performed in accordance with the change.

14. The method of claim 13, wherein the condition is patent ductus arteriosus.

15. The method of claim 14, wherein, after treatment for the patent ductus arteriosus, steps (a) and (b) are performed again to monitor effectiveness of the treatment.

16. A method for detecting limb ischemia in a patient, the method comprising:

(a) taking a pulse volume measurement of a limb of the patient in which the ischemia is to be detected;

(b) taking a pulse volume measurement of another limb of the patient;

(c) computing a ratio of the pulse volume measurements taken in steps (a) and (b); and

(d) detecting the ischemia in accordance with the ratio.

17. The method of claim 16, wherein steps (a)-(c) are performed a plurality of times to detect a change in the ratio, and wherein step (d) is performed in accordance with the change in the ratio.

18. The method of claim 17, wherein the limb of step (a) and the limb of step (b) are the patient's legs.

19. The method of claim 18, wherein steps (a)-(c) are performed both before and after insertion of a catheter into the limb of step (a).

20. The method of claim 18, wherein the ratio is used to determined which of the patient's legs is to receive a catheter.

21. The method of claim 16, wherein the ischemia to be detected is caused by a cast.

22. A method for optimizing performance of a balloon pump in a patient, the method comprising:

(a) inserting the balloon pump into the patient;

(b) taking a plurality of pulse volume measurements of the patient; and

(c) adjusting a rate of counterpulsation of the balloon pump to maximize one of the pulse volume, a peak net inflow, an area under a pulse volume curve and a pulse volume x heart rate product as determined in step (b).

23. The method of claim 22, wherein step (b) is performed for both a catheterized limb and an uncatheterized limb.

24. A method for detecting peripheral vascular disease in a patient, the method comprising:

(a) taking quantitative pulse volume measurements at a plurality of positions on the patient's limbs; and

(b) from the quantitative pulse volume measurements, detecting the peripheral vascular disease.

25. The method of claim 24, wherein step (b) comprises calculating one of a peak net inflow, an area under a pulse volume curve and a pulse volume x heart rate product for each of the patient's limbs.

26. The method of claim 24, wherein steps (a) and (b) are performed both before and after intervention to correct the peripheral vascular disease to determine whether the peripheral vascular disease has recurred.

27. The method of claim 24, wherein steps (a) and (b) are performed both before and after intervention to correct the peripheral vascular disease to determine an effectiveness of the intervention.

28. A method for detecting congestive heart failure in a patient, the method comprising:

(a) taking a pulse volume measurement from the patient; and

(b) detecting the congestive heart failure in accordance with the pulse volume measurement.

29. The method of claim 28, wherein step (a) is performed a plurality of times to determine a parameter which is one of a peak net inflow, an area under a pulse volume curve and a pulse volume x heart rate product, and wherein step (b) is performed in accordance with the parameter.

30. The method of claim 28, wherein step (a) is performed both when the patient is under medical control and when the congestive heart failure is to be detected.

31. The method of claim 28, wherein steps (a) and (b) are repeated to monitor treatment of the congestive heart failure.

32. A method for evaluating a vasoactive medication, the method comprising:

(a) taking a first pulse volume measurement from the patient before administering the vasoactive medication to the patient;

(b) administering the vasoactive medication to the patient;

(c) taking a second pulse volume measurement from the patient after administering the vasoactive medication to the patient; and

(d) determining an effectiveness of the vasoactive medication in accordance with the first and second pulse volume measurements.

33. The method of claim 32, wherein each of steps (a) and (c) is performed a plurality of times to derive one of a peak net inflow, an area under a pulse volume curve and a pulse volume times heart rate product.

34. A method for detecting syncope in a patient, the method comprising:

(a) taking a plurality of pulse volume measurements from the patient in a period of time;

(b) causing the patient to move from a reclining position to an upright position in the period of time of step (a); and

(c) detecting the syncope from the plurality of pulse volume measurements of step (a).

35. The method of claim 34, wherein step (c) comprises detecting a decrease in pulse volume.

36. The method of claim 34, wherein step (c) comprises detecting a decrease in one of a peak net inflow, an area under a pulse volume curve and a pulse volume x heart rate product.

37. A method for detecting an abnormality in tissue fluid content in a patient, the method comprising:

(a) taking a pulse volume measurement of the patient; and

(b) detecting the abnormality in accordance with the pulse volume measurement.

38. The method of claim 37, wherein the abnormality is dehydration.

39. The method of claim 38, wherein steps (a) and (b) are continued through treatment for the dehydration.

40. The method of claim 37, wherein the abnormality comprises pre-eclampsia.

41. The method of claim 40, wherein step (a) comprises detecting a total limb impedance of the patient, and wherein step (b) is performed in accordance with the total limb impedance.

42. A method for detecting deep vein thrombosis in a patient, the method comprising:

(a) detecting overall limb impedance in the patient; and

(b) detecting the deep vein thrombosis in accordance with the over limb impedance.

43. The method of claim 42, wherein step (a) comprises detecting limb impedance in a limb for which the deep vein thrombosis is suspected and another limb, and wherein step (b) comprises comparing the limb impedance in the limb for which the deep vein thrombosis is suspected and for the other limb.

44. A method for detecting thermal injuries in a patient, the method comprising:

(a) taking a pulse volume measurement from the patient; and

(b) detecting the thermal injuries from the pulse volume measurement.

45. The method of claim 44, wherein the thermal injuries comprise frostbite.

46. The method of claim 44, wherein the thermal injuries comprise burns.

47. The method of claim 44, wherein steps (a) and (b) are performed a plurality of times to monitor recovery from the thermal injuries.

48. A method for detecting vascular instability in patients undergoing renal dialysis, the method comprising:

(a) taking a plurality of pulse volume measurements from the patient;

(b) from the plurality of pulse volume measurements, detecting a fluctuation in one of a pulse volume, a peak net inflow, an area under a pulse volume curve and a pulse volume x heart rate product; and

(c) from the fluctuation detected in step (b), detecting the vascular instability.

49.A method for determining an effect of radial artery resection on circulation in a patient's hand, the method comprising:

(a) taking a first pulse volume measurement from the patient's hand with the radial artery in an uncompressed condition;

(b) compressing the radial artery;

(c) taking a second pulse volume measurement from the patient's hand with the radial artery in a compressed condition; and

(d) from the first and second pulse volume measurements, determining the effect of radial artery resection.

50. A method for non-invasively detecting a change in cardiac output in a patient; the method comprising:

(a) taking a plurality of pulse volume measurements over time from the patient;

(b) from the plurality of pulse volume measurements, determining a change in one of a pulse volume, a peak net inflow, an area under a pulse volume curve and a pulse volume x heart rate product; and

(c) from the change determined in step (b), detecting the change in the cardiac output.

51. A method for determining a cause of hypertension in a patient, the method comprising:

(a) taking a first pulse volume measurement from the patient;

(b) after step (a), administering a vasodilator to the patient;

(c) after step (b), taking a second pulse volume measurement from the patient;

(d) from the first and second pulse volume measurements, determining an effect of the vasodilator on the patient's pulse volume; and

(e) from the effect determined in step (d), determining the cause of the hypertension.

52. The method of claim 51, wherein each of steps (a) and (c) comprises determining a parameter which is one of a peak net inflow, an area under a pulse volume curve and a pulse volume x heart rate curve, and wherein step (d) is performed in accordance with the parameter.

53. A method for determining a change in muscle flow capacity of a patient, the method comprising:

(a) taking a first pulse volume measurement from the patient as a baseline measurement;

(b) taking at least one additional pulse volume measurement from the patient after the baseline measurement; and

(c) from the baseline measurement and the at least one additional pulse volume measurement, determining the change in muscle flow capacity.

54. The method of claim 53, wherein step (a) is performed before the patient begins an exercise program, and wherein step (b) is performed while the patient is in the exercise program.

55. The method of claim 54, wherein each of steps (a) and (b) is performed after a treadmill exercise.